SIPMOS® Small-Signal-Transistor

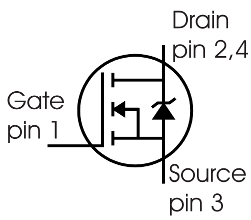
Feature

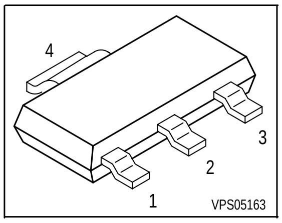
- N-Channel
- Enhancement mode
- Logic Level
- d*v*/d*t* rated
- Pb-free lead plating; RoHS compliant

Product Summary

V_{DS}	200	V
$R_{DS(on)}$	1.8	Ω
I_D	0.66	A

PG-SOT-223





Type	Package	Tape and Reel Information	Marking
BSP297	P-SOT-223	E6327: 1000 pcs/reel	BSP297
BSP297	PG-SOT-223	L6327: 1000 pcs/reel	BSP297

Maximum Ratings, at T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Value	Unit
Continuous drain current	I_D		A
T_A=25°C		0.66	
T_A=70°C		0.53	
Pulsed drain current	$I_{D\ puls}$	2.64	
T_A=25°C			
Reverse diode d*v*/d*t*	d*v*/d*t*	6	kV/µs
I_S=0.66A, V_{DS}=160V, d*i*/d*t*=200A/µs, T_{jmax}=150°C			
Gate source voltage	V_{GS}	±20	V
ESD Sensitivity (HBM) as per MIL-STD 883		Class 1	
Power dissipation	P_{tot}	1.8	W
T_A=25°C			
Operating and storage temperature	T_j , T_{stg}	-55... +150	°C
IEC climatic category; DIN IEC 68-1		55/150/56	

Thermal Characteristics

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Characteristics					
Thermal resistance, junction - soldering point (Pin 4)	R_{thJS}	-	15	25	K/W
SMD version, device on PCB:	R_{thJA}				
@ min. footprint		-	80	115	
@ 6 cm^2 cooling area [1)]		-	48	70	

Electrical Characteristics, at T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Static Characteristics					
Drain-source breakdown voltage V_{GS}=0, I_D=250µA	$V_{(BR)DSS}$	200	-	-	V
Gate threshold voltage, V_{GS} = V_{DS} I_D=400µA	$V_{GS(th)}$	0.8	1.4	1.8	
Zero gate voltage drain current	I_{DSS}				µA
V_{DS}=200V, V_{GS}=0, T_j=25°C		-	-	0.1	
V_{DS}=200V, V_{GS}=0, T_j=150°C		-	10	100	
Gate-source leakage current V_{GS}=20V, V_{DS}=0	I_{GSS}	-	1	10	nA
Drain-source on-state resistance V_{GS}=4.5V, I_D=0.53A	$R_{DS(on)}$	-	1.2	3	Ω
Drain-source on-state resistance V_{GS}=10V, I_D=0.66A	$R_{DS(on)}$	-	1	1.8	

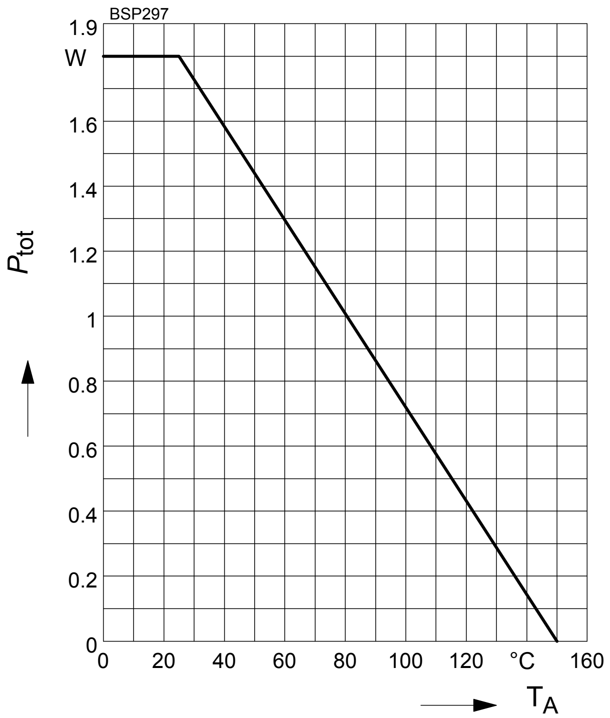
[1]Device on 40mm*40mm*1.5mm epoxy PCB FR4 with 6cm² (one layer, 70 µm thick) copper area for drain connection. PCB is vertical without blown air.

Electrical Characteristics, at T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Dynamic Characteristics						
Transconductance	g_{fs}	V_{DS}≥2*I_D*$R_{DS(on)max}$, I_D=0.53A	0.47	0.94	-	S
Input capacitance	C_{iss}	V_{GS}=0, V_{DS}=25V, f=1MHz	-	286	357	pF
Output capacitance	C_{oss}		-	38	47	
Reverse transfer capacitance	C_{rss}		-	15.7	23.5	
Turn-on delay time	$t_{d(on)}$	V_{DD}=100V, V_{GS}=4.5V, I_D=0.6A, R_G=15Ω	-	5.2	7.8	ns
Rise time	t_r		-	3.8	5.7	
Turn-off delay time	$t_{d(off)}$		-	49	74	
Fall time	t_f		-	19	29	
Gate Charge Characteristics						
Gate to source charge	Q_{gs}	V_{DD}=160V, I_D=0.66A	-	0.7	0.9	nC
Gate to drain charge	Q_{gd}		-	5.2	7.8	
Gate charge total	Q_g	V_{DD}=160V, I_D=0.66A, V_{GS}=0 to 10V	-	12.9	16.1	
Gate plateau voltage	$V_{(plateau)}$	V_{DD}=160V, I_D = 0.66 A	-	2.7	3.3	V
Reverse Diode						
Inverse diode continuous forward current	I_S	T_A=25°C	-	-	0.66	A
Inv. diode direct current, pulsed	I_{SM}		-	-	2.64	
Inverse diode forward voltage	V_{SD}	V_{GS}=0, I_F = I_S	-	0.84	1.2	V
Reverse recovery time	t_{rr}	V_R=100V, I_F=I_S, di_F/dt=100A/µs	-	52	78	ns
Reverse recovery charge	Q_{rr}		-	80	120	nC

1 Power dissipation

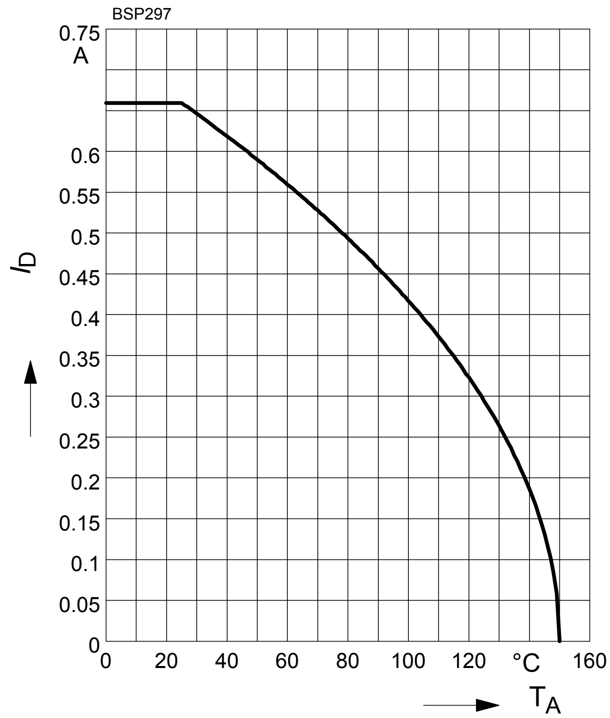
$P_{tot} = f(T_A)$



2 Drain current

$I_D = f(T_A)$

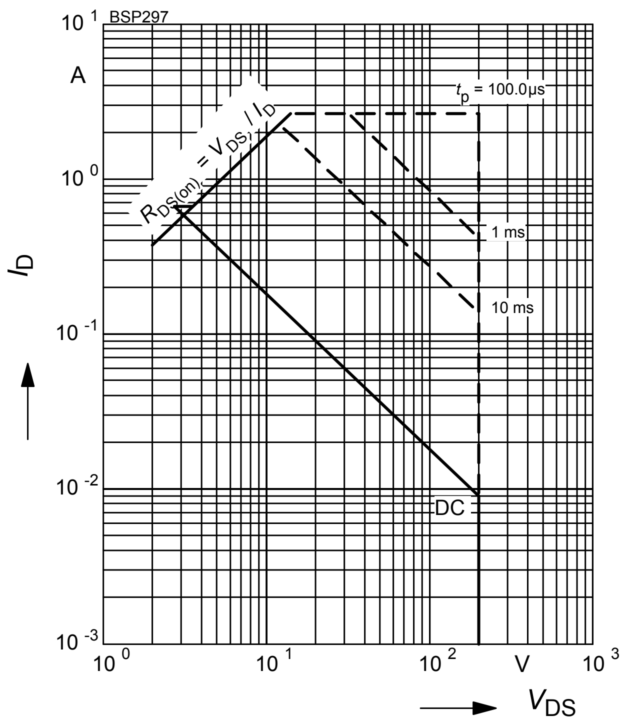
parameter: $V_{GS} \geq 10$ V



3 Safe operating area

$I_D = f(V_{DS})$

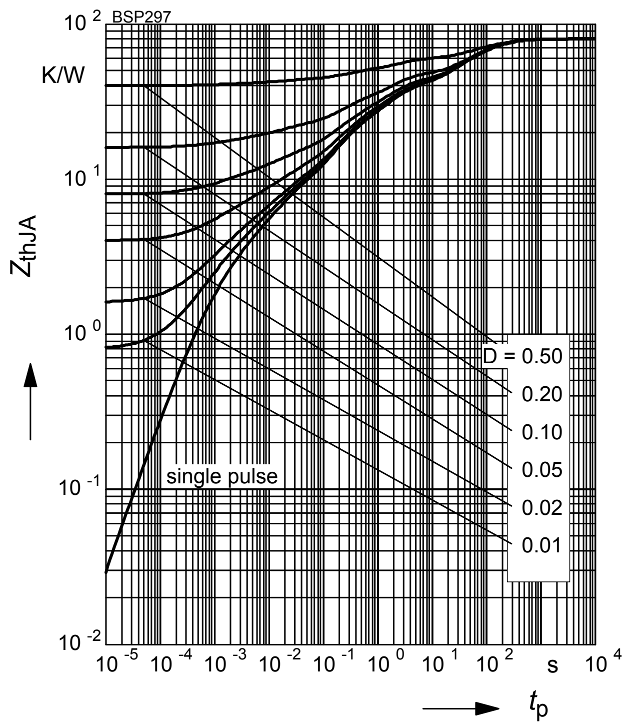
parameter : $D = 0$, $T_A = 25$ °C



4 Transient thermal impedance

$Z_{thJA} = f(t_p)$

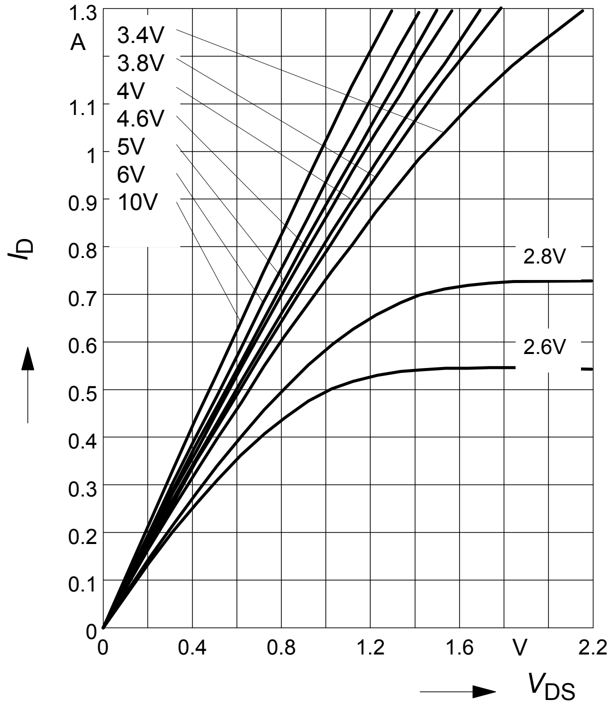
parameter : $D = t_p/T$



5 Typ. output characteristic

$I_D = f(V_{DS})$

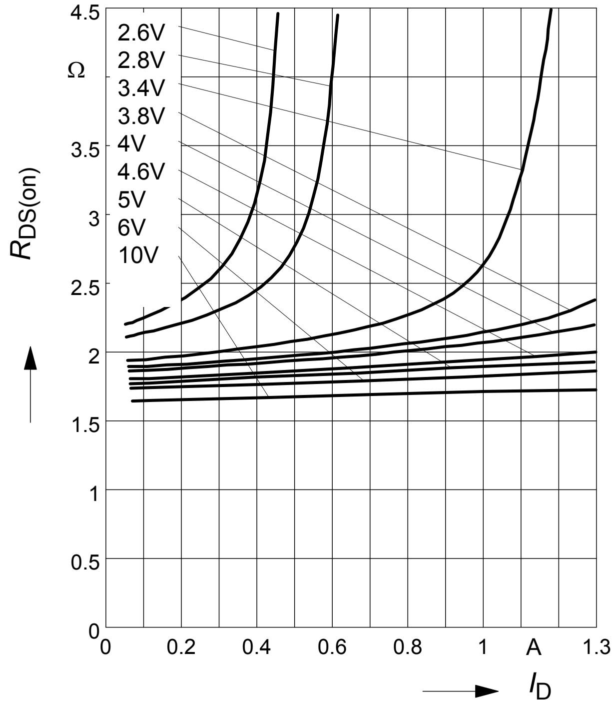
parameter: T_j = 25 °C, V_{GS}



6 Typ. drain-source on resistance

$R_{DS(on)} = f(I_D)$

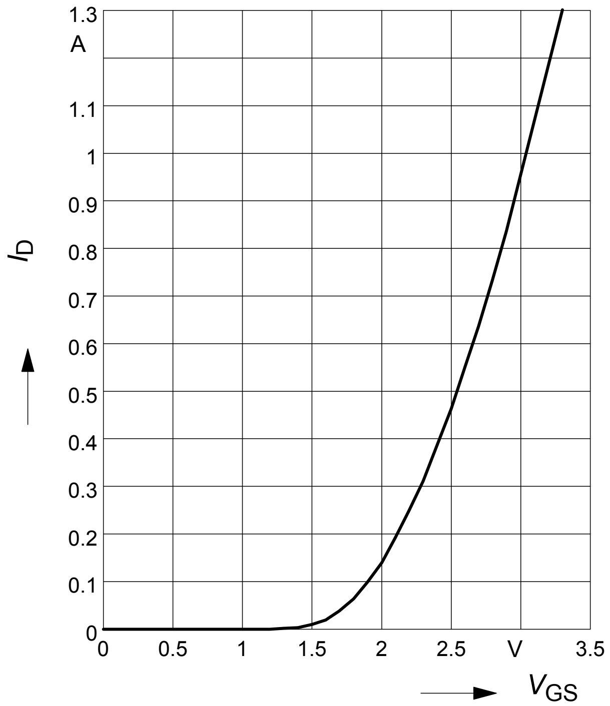
parameter: T_j = 25 °C, V_{GS}



7 Typ. transfer characteristics

$I_D = f(V_{GS})$; $V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$

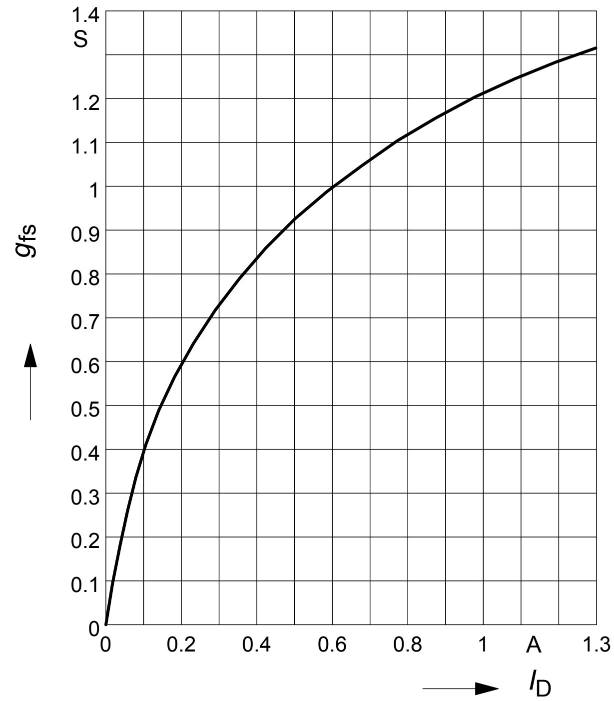
parameter: T_j = 25 °C



8 Typ. forward transconductance

$g_{fs} = f(I_D)$

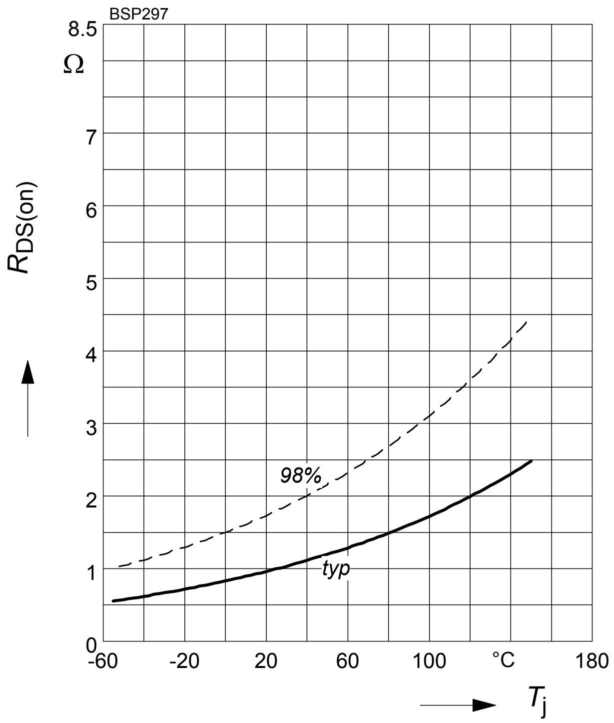
parameter: T_j = 25 °C



9 Drain-source on-state resistance

$R_{DS(on)} = f(T_j)$

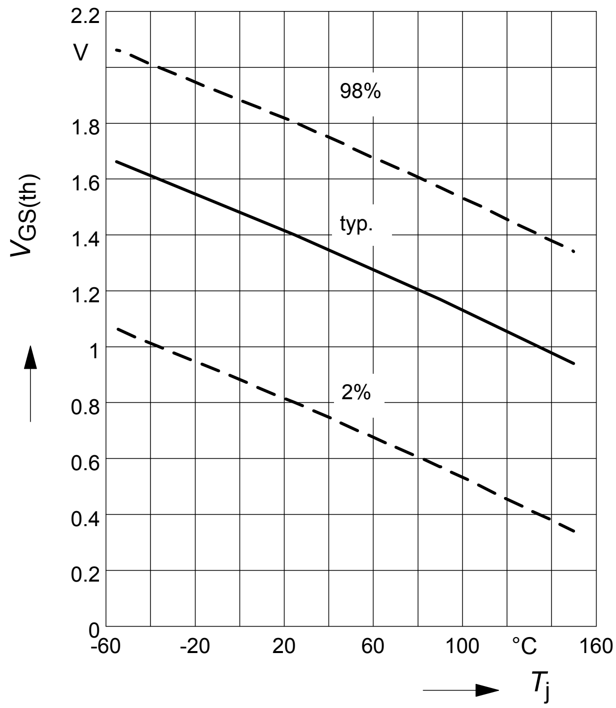
parameter : I_D = 0.66 A, V_{GS} = 10 V



10 Typ. gate threshold voltage

$V_{GS(th)} = f(T_j)$

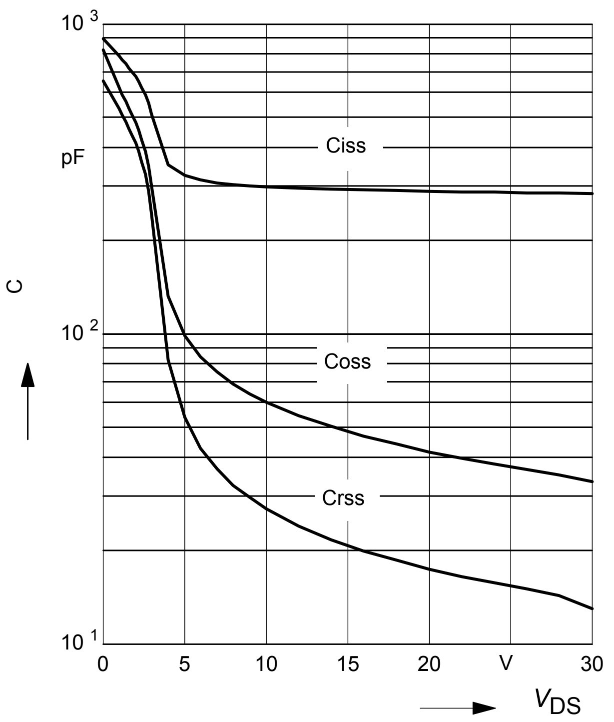
parameter: $V_{GS} = V_{DS}$; I_D =400µA



11 Typ. capacitances

$C = f(V_{DS})$

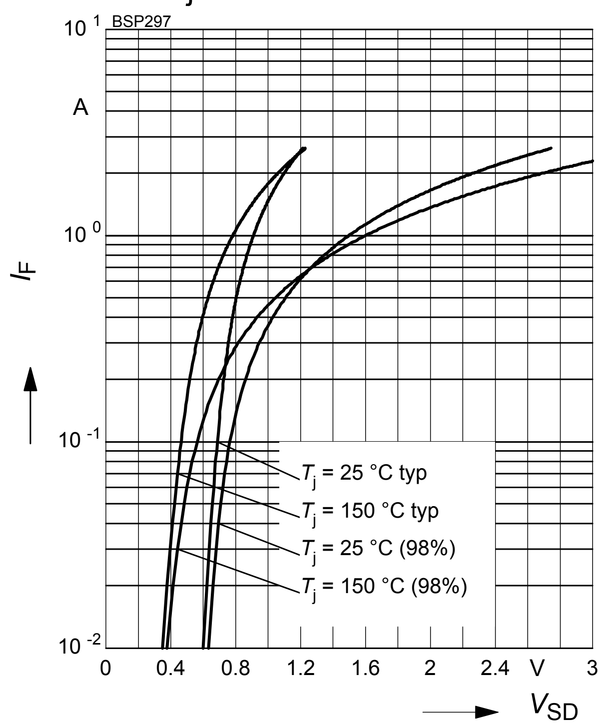
parameter: V_{GS}=0, f=1 MHz, T_j = 25 °C



12 Forward character. of reverse diode

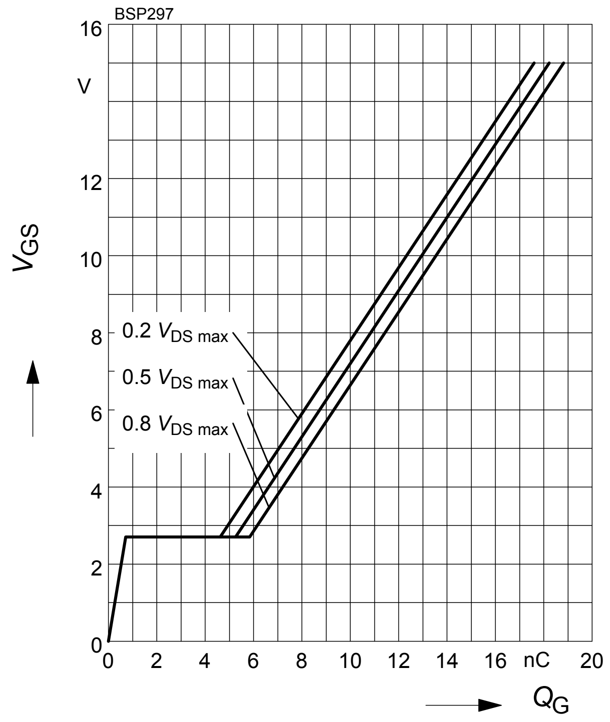
$I_F = f(V_{SD})$

parameter: T_j



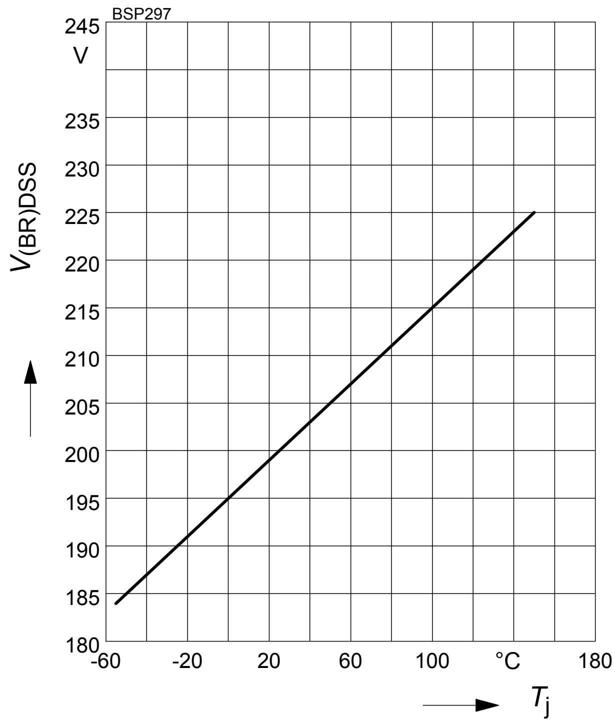
13 Typ. gate charge

$V_{GS} = f\ (Q_G)$; parameter: V_{DS} ,
I_D = 0.66 A pulsed, T_j = 25 °C



14 Drain-source breakdown voltage

$V_{(BR)DSS} = f\ (T_j)$



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